

Building an online and interactive scientific data explorer for LifeWatch observatory data

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The marine observatory that is being established as a contribution to LifeWatch is becoming operational. The spatial surveys with the RV Simon Stevin that cover the Belgian part of the North Sea are running with a monthly frequency. The sensors networks with biosensors like bird GPS tags, acoustic fish tag receivers, C-pods, acoustic bat recorders are growing and data flow is being organized. In order to provide access to the observatory data and to support scientific validation of the generated data, a scientific data explorer was developed. This online and interactive tool allows users to perform exploratory data analysis and create advanced data visualizations.

In a first step a user defines a selection of data that is loaded from the database into the application. Consequently the app displays a series of visualizations based on the default settings: choropleth point maps, box plots, time series line charts, X-Y plots, etc. A sidebar of the app allows the user to further modify or optimize the settings of the analyses or visualizations. The user can request additional data fields like tides, moon illumination and sun position. The data can be displayed in tabular form and downloaded as tab delimited text files to the local drive for further analysis.

From a technological perspective the tool has been built using the R Shiny framework. R shiny is a web application framework for R suitable for both desktop and mobile devices. The choice for using this R based approach is supported by the fact that R has a lot of well-developed powerful high level functions for data processing and visualization. Since R is broadly accepted as open source programming language for data analysis in biodiversity and ecosystem studies the developed scripts can be made available and re-used by scientists. A dedicated and performant virtual Linux machine has been set up running the Shiny Server. The application is made available through the Lifewatch.be regional portal.